

Cost and Management

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No. 2

ANALYZING THE FINANCIAL SIDE OF THE UNION AGENDA

By Donald H. Millett 58

Mr. Millett has been Treasurer of the Eastern Corporation, in Bangor, Maine, since 1950. He received his A.B. degree from Colby College, Waterville, Maine in 1928 and his M.B.A. degree from Harvard Graduate School of Business Administration in 1931. Until 1943 he worked in the managerial and accounting fields of public utility operation and prior to his present position was Office Manager of the former Maine Seaboard Paper Company in Bucksport, Maine.

PREPARING FOR OFFICE AUTOMATION

By H. W. Rowlands 66

A graduate of the University of Toronto in Commerce and Finance, Mr. Rowlands has been a management consultant with J. D. Woods & Gordon Limited, Toronto, since 1952, and prior to this was employed with the Royal Bank of Canada and in the Comptroller's Division of the Bell Telephone Company. A specialist in organization, administrative controls and methods problems, he has, more recently, concentrated on the use of electronic data processing equipment in all types of organizations. His studies on this subject have taken him to most of the computer manufacturing and training centres on this continent and as far afield as Wayne and Harvard universities.

MANUAL ASPECTS OF I.D.P.

By E. F. Stevens 76

Mr. Stevens, a senior partner in Urwick, Currie Ltd., articulated in Chartered Accountancy in England, becoming Senior Accountant to a large Far Eastern Managing concern. He came to Canada in 1949 and prior to joining Urwick, Orr & Partners, Ltd. was Controller of Canadian Food Products and Assistant to the Vice-President, Overseas Operations in Ford of Canada.

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Editorial Comment . . .

CHALLENGING OPPORTUNITIES IN INDUSTRIAL ACCOUNTING

Canada may be known as a land of opportunity but many Canadians who have come to a halt in their jobs are probably asking themselves just where that opportunity lies. They may be qualified members of a trade or profession, yet still have overlooked the fundamental requirements of getting ahead.

The first question any prospective neophyte in a profession will undoubtedly ask is "What can the profession offer me?" All gold-plated and glib promises to the contrary, this can only be truthfully answered by another question, "What can you offer the profession?" Equivocal as such an answer may be, it is certainly true that the rewards of any calling are no greater than the effort that goes into it.

There are many roads to success. Industrial accounting happens to be a particularly satisfying and well-rewarded one, if the practitioner has the right qualifications. In a predominately industrial and scientific age, this can hardly fail to be so, especially as accounting is the heart of financial management and financial management is the core of the enterprise.

The opportunities in industrial accounting are manifold and rich, but opportunities are fulfilled only when certain fundamental conditions are met. The first requirement of success in this field is complete mastery of the basic technical knowledge of accounting. The R.I.A. course will provide this training and no more. We must recognize here that it is impossible to do more than cover basic principles in a four year course and many important areas such as communications, economics, market analysis, forecasting, systems, business administration, human relations and corporation finance must perforce be skimmed lightly or entirely left out. At this point we might quote from an article by Mr. Donald Parry in a lecture on accounting education at Harvard University.

"After all, the particular problems and cases which might be presented in an accounting curriculum would not exhaust the field in a lifetime of study. The student should realize this and understand that a career in any profession calls for continuing study and research . . . Liberal education will place a man on an equal social and intellectual footing with other professional people . . . The purpose of study of the liberal arts is not to acquire a store of facts but rather ideas of attitudes and particularly a set of standards which enable the educated man to recognize the first rate in any field, including his own".

And here we are approaching the second condition of success in industrial accounting—the recognition of the need for continuing education. If the aspirant can master the basic principles of accounting as presented in the R.I.A. courses, he has the necessary mental ability, to quote an old truism, to proceed from schooling to education. As Mr. Parry notes, education as exemplified by the liberal arts curriculum is not so much the accumulation of a store of facts but the acquisition of an inquiring state of mind.

EDITORIAL COMMENT

It is quite possible for a man to arrive at an educated state of mind without the benefit of a liberal arts education, but the process usually takes longer and follows a more circuitous route. It would be a pity if, as some would advocate, the liberal arts courses were ever deleted from the educational curriculum. A continuing programme of education is doubly necessary where there has been no liberal arts education and this S.I.C.A. takes into account in its continual programme of educational activities. In general, the qualities fostered by an educated state of mind are initiative, logic, inquisitiveness, experimentalism and ingenuity.

In some respects the educated state of mind will condition the third requisite of accounting success—personal qualifications. Foremost among these are the qualities of human understanding, imagination and ingenuity. Though these attributes are usually considered native to the individual, latent potentialities can be brought to light through study and practice. Some interesting experiments along this line have recently been undertaken by the Dupont Company in its creative thinking classes.

The fourth qualification for grasping the opportunities offered by the accounting field is this: the accountant must be thoroughly familiar with all aspects of the business in which he is employed, its policies, products or services and the more significant problems of operating the business. It is not enough for the accountant to be satisfied with mere routine. He must be always striving to improve, perfect and create new systems, to spot and eliminate waste in time, effort and facilities.

It is seldom necessary to go outside our place of employment to find opportunities. Opportunities are everywhere. True, we cannot all be supervisors; nor can all supervisors become controllers, vice-presidents, or presidents. There are just not enough of these jobs available, nor do we all have the essential qualities of leadership, tact, drive and energy to attain them. However, one of the outstanding attributes of the accounting profession is the opportunity it offers for specialization. There are many areas ripe for development—among them budgeting control and analysis, statistical analysis, forecasting, internal auditing, systems and procedures, machine accounting and I.D.P. In the specialized and exacting world of today, the possibilities in each field are endless, hitherto undreamed of techniques are waiting for discovery, and when the opportunity is grasped, the rewards will come up to all the brightly painted expectations of the acolyte.

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C. & M. Round-Up . . .

By N. R. BARFOOT

LOOKING AHEAD

Imports from Russia are increasing. Almost a million last year. Five times the previous year. Platinum, palladium, iridium and furs are the chief items.

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Gasoline Marketing Fight in progress. New multi-octane gasoline will be produced to woo the motorists' dollars. Some companies will add a third grade high octane fuel, others will step up their regular grades. Higher consumer prices will result—competition in reverse?

—o—o—

Union Objectives in 1957 will centre on (a) wage increases, (b) industrial pension plan on a nation wide scale, (c) strengthening the union movement generally.

—o—o—

Higher Steel Prices are in the offing. Higher wage, scrap ore, coal and coke, and freight costs will drive up the cost of steel per ton.

—o—o—

Trans Canada Airlines will have a complete line of turboprop or jet powered planes within four years. Everyone has enjoyed the Viscount ride and undoubtedly the public acclaim for these fine planes has prompted T.C.A. to extend the line with Vickers Vikings.

—o—o—

Cost of Living is again rising, and will surge upwards perhaps six points this year.

—o—o—

NO SHORT CUT TO SUCCESS

A recent A.M.A. Conference survey finds that hard work and long years brought the boss to where he is.

There is no short cut in job or salary.

Top managers have worked on an average 26 years, 15 of them as executives, and earn between 20 and 30 thousand per year.

Middle management men have been working 20 years, 10 as executives, and earn 10 to 15 thousand per annum.

Top bracket men put in 18½ hours extra per week, while middle management put in 11 overtime hours.

The survey shows liberal arts graduates have been more successful than specialists.

Among the specialists—lawyers earn most, followed by science and business graduates.

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RESEARCH IN CANADA

Most Canadian industries do very little research.

318 firms only maintain their own Research Departments.

They spent about 62 million last year.

C. & M. ROUND-UP

Others spent about 12 million to have it done outside, mostly in the United States.

The U.S. figure is about 5 billion.

Out of 2,500 firms contacted, D.B.S. says that 1,722 reported they were not doing anything or paying for anything.

235 firms stated they got it free.

Practically all expenditures fall into these categories: Mechanical Engineering, 24%; Electrical Engineering, 21%; Chemistry, 20%; Metallurgy, 9%.

You must be doing a minimum of 2 million in sales a year in order to support a Lab. A small one with just one scientist will cost you \$50,000 per annum.

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HOMES—1957

More of the \$14,000.—\$18,000. range will be built.

Trend is to basement-less type.

Built-in laundry equipment will be included in the price.

The split-level and bungalow type will lead in sales.

Designs will provide maximum space so that mortgages can be increased and down payments reduced.

Special treatment of roofs and custom exterior colour schemes will be available.

Most new homes will carry a warranty covering, in some cases, as long as the first year of occupancy.

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POOR DRIVERS

Since 1951 Manitoba has operated a demerit point system on car drivers. Some interesting facts result:

4,900 drivers have been pin pointed as the chief offenders.

They are only 1.7% of all drivers, but were involved in 27% of the accidents.

Out of 109 fatal accidents in 1955, 30 were caused inside this group.

According to the classification system, 1,681 of these were considered problem drivers and 3,193 as dangerous drivers.

There are five major groupings—Here they are with a percentage total of licensed drivers:

- | | |
|---|----------------|
| 1. Competent experienced drivers | 73.5% of total |
| 2. Beginners | 11.2% |
| 3. Questionables, have had warnings | 13.6% |
| 4. Problem drivers, driving on probation, involved in accidents from time to time | .6% |
| 5. Dangerous drivers, suspended more than once | 1.1% |

It will be interesting to see what the Provincial authorities do with the problem now that they have sorted it out.

COST AND MANAGEMENT

ON THE PERSONAL SIDE

Headaches are most common among business executives. 77% of them have recurring headaches. 50% of farmers suffer from them.

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Memory for facts is becoming less and less important. Wisdom is the use of facts is the essential attribute for solving problems in the complete life of today. So says a Rutgers professor.

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Note for Accountants—A recent survey among thousands of university graduates in business, showed that non-engineers put English Communications first as the most useful subject. Engineers put Math. first, but English second. They figure factory men should pay more attention to the Queen's English both in speaking and writing.

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Schizophrenia, the most prevalent of mental diseases, may be biochemical in origin rather than psychological. A researcher has been able to induce it in normal people by injecting substances found only in the blood of schizophrenia sufferers.

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Flying is on the Increase. Nearly 90 million people will take to the air this year. An estimated 15% increase over 1956.

—o—o—

Women's Skirts show a downward trend for '57. The arbiters of fashion have decreed the longer skirt. Nothing really exciting ever happens to men's clothes. Two or three button suits, notched or peaked lapels are the only choices; very dull indeed.

OBITUARY

With deepest regret we announce the death of J. B. A. Merineau, C.A., R.I.A., one of the founders of the Montreal Chapter and its first Chairman.

Mr. Merineau was City Auditor for the City of Montreal and had been in the city's employ since 1903 following his graduation from the University of Montreal.

He was first Vice-President of the Society of Industrial and Cost Accountants of Quebec for 1945-46 and a member of the Provincial Council for several years. He also served as Treasurer of the Quebec Society in 1953-54 and on the Dominion Board for several years commencing in 1947.

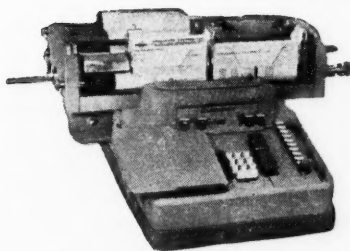
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Books in Review . . .

BUSINESS ELECTRONICS REFERENCE GUIDE — VOL. 3

Controllership Foundation Inc., New York, 1956, \$6.00

Reviewed by B. H. BRECKENRIDGE, *R.I.A.*

Electronics is a growing and many sided subject. To grow with it, unless you are selective, you must spend considerable time reading. This latest study, published by the Research Arm of the Controllers' Institute of America, will do much of your intellectual legwork for you.

The first section reports on installations of electronic digital computer systems in operation on a normal run basis. Here you will find listed, by companies that have installed such equipment, the make, model, quantity installed and the applications found for the equipment.

Next is given a listing of computing centres whose services are available on a commercial fee basis, followed by a full chapter devoted to a comprehensive description of electronic digital computing systems which may be rented or purchased

The closing sections deal with regularly scheduled conferences, seminars, training programmes and visual presentations available, and the book ends with a detailed bibliography of all worthwhile literature on computers published between January 1st, 1956, and July 15th, 1956.

MANAGEMENT FOR TO-MORROW

*Wallace Book Division of the Chilton Company, Montreal, Quebec, 1956.
\$6.75.*

Reviewed by C. M. BLOOMFIELD, *B. Com., R.I.A.*

This is a report of the technical proceedings of the eighth annual conference of the Society for Advancement of Management, held in Philadelphia in 1956.

The general theme of this conference was "Management for Tomorrow" and the various addresses and articles together form a well rounded discussion of all the facets of scientific management, both as it is practised today, and as future developments may affect it.

The conference proceedings covered all phases of management principles and problems. Included in the discussions were the following topics: General Administration, Internal Audit, Development of Managers, Incentive Controls and Methods of Incentive Payment, Opinion Surveys, Production and Productivity, and Labour Relations. The authors of these addresses are well qualified in their respective fields, being either Executives, Consultants, or Professional Lecturers.

This reviewer was most impressed with the articles on Control by Incentives, although every article was thought provoking and informative.

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Business Development and New Financing	J. C. Chaston, C.A., Pemberton Securities Limited, Vancouver
Case Studies on each of the Above Topics	Members of the Faculty of Commerce of The University of Alberta
The Gordon Economic Report	Dr. Andrew Stewart, President, The University of Alberta

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**THE SOCIETY OF INDUSTRIAL AND COST ACCOUNTANTS
OF CANADA**

31 Walnut St. South

Hamilton, Ontario

Analyzing the Financial Side of the Union Agenda . . .

By DONALD H. MILLETT,
Comptroller, Eastern Corporation,
Bangor, Maine.

In an epoch of union pre-eminence, many companies do not fully appreciate the importance of an intelligent approach to labour bargaining the author contends. Labour negotiations call for the utmost skill and painstaking preparation of reports. Using a mythical union agenda, the author conducts an item-by-item analysis of the accountant's preparation for each.

THE increasing publicity of and emphasis upon labour negotiations clearly points up their importance in the overall picture of a company's operations. The effect upon operating costs of the success or failure of the few days spent in negotiating a labour contract are tremendous. In the case of most companies no single period of time is as important. However, we find many companies coming to the bargaining table unprepared as to the cost effects of the union demands. This applies not only to the small company having an unorganized labour force but also to such industrial greats as General Motors and their militant unions. In commenting upon the recent wage negotiations with General Motors, Walter Reuther, president of the U.A.W.-C.I.O. specifically stated that General Motors had, to use his words, "neglected to do their homework".

Starting in the early thirties, the growth of organized labour in both numbers and power was constant as well as rapid. In general the atmosphere in which labour negotiations have been carried on has improved during recent years. The dividends of being well prepared on all phases of the union requests are such that no company can afford to not spend the necessary time in evaluating and discussing all possible courses of action. It is in this field of preparation and analysis that the negotiator must rely upon the accountant. Parenthetically, it is my opinion that the accountant, with his ability in dealing with the facts of a given situation, can be trained into a top-flight negotiator.

A Theoretical Case

In order to portray just what the accountant can contribute in the way of analyzing the financial side of the union requests let us take a mythical agenda for a labour contract meeting and deal with each item as it arises. The following might very well be the financial, or monetary items on an agenda presented to the management of a company by the unions present in its plant.

MEMORANDUM AGENDA FOR LABOUR CONFERENCE
BETWEEN
L. M. N. COMPANY
AND
FEDERATED WORKERS UNION, LOCAL NO. 1

ANALYZING THE FINANCIAL SIDE OF THE UNION AGENDA

Union requests the following:

- (1) A general wage increase of 15 percent.
- (2) Two more paid holidays.
- (3) Increase of five cents per hour in the shift differential for the second shift and ten cents per hour for the third shift.
- (4) An additional week's vacation with pay for all employees having twenty-five (25) years of continuous service with the company.
- (5) Double time for all work performed on Sundays.
- (6) Increase in the life insurance programme.
- (7) Revision of the group hospitalization insurance plan with increased coverage.
- (8) Revision of the pension plan.
- (9) A profit sharing plan of the company's net profits.
- (10) Establishment of an incentive pay system in the finishing department.

The accountant will recognize at the outset that certain of the items are window dressing and as such are regarded by the unions as being readily expendable. An example of such an item would be No. 9. It is on the agenda for the record and as far as can be foreseen will not be pushed in any great degree by the unions.

Other items contain window dressing, but in their entirety will be dropped by the unions only at the expense of concessions elsewhere on the part of the company. Examples of such items would be numbers 6, 7 and 8 on our agenda. These requests can be denied in their entirety only at the expense of more liberal settlement under some other item or items.

The accountant is also aware of the fact that some of the items contain requests in amounts which are readily bargainable downwards. There is a point, however, in items of this nature at which the unions will stiffen and further reduction is gained only at the expense of blood, sweat and tears on the part of the management. Prime examples of this class of item are numbers 1 and 3. The union does not expect to obtain a fifteen (15) percent increase or an increase of 5 and 10 in the already existing shift differential of 4 and 6. They do, however, expect to get something under each one of these items and they will have pretty definite ideas as to how little they will accept.

Methods of Approach to Bargaining

Of vital importance to the negotiating picture as a whole is the method of approach. Some unions insist on an item by item approach which means that Item No. 1 must be taken up, discussed and settled before anything can be done in regard to Item No. 2. If possible use of this approach should be avoided as it may very well lead to either a deadlock in the negotiations or unwarranted settlements in certain

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fields at the expense of others. A much more sound approach is to arrive at an agreement at the outset that the settlement is a package deal and that the offer under each item is conditioned by and dependent upon every other offer. The advantages of this method of approach accrue to both unions and management. On the one hand it allows for last minute flexibility in trading up or down on certain items and on the other it affords an opportunity to correctly evaluate the liability incurred in the settlement and no one request is turned down because of commitments made prior to its consideration.

The accountant must evaluate each request as to its type and importance in the overall picture. Furthermore the accountant must take into account the method of approach that will be used in the negotiations. For instance should the item by item approach be used that fact will have a material bearing on just what schedules the accountant prepares for the contract session. If, on the other hand, the package settlement method is going to be used the schedules prepared by the accountant should provide for alternative settlements and adjustments as between one request and another. How far the accountant is able to go in determining the number and context of his schedules depends primarily on his ability to present factual information to management in a form readily understandable and of value in settling the question at hand. The truly creative accountant as opposed to the bookkeeper accountant will find that he has to limit the variety and extent of his schedules in the field of wage negotiations, rather than not presenting enough data in connection with the same.

The General Wage Increase

The first item of our mythical agenda is for a fifteen (15) percent increase straight across the board. This request is of course the hub of the whole meeting. Everything else is secondary and is knit into the overall situation only through its relationship to the general wage increase request. Due to the importance of this request the accountant cannot be too well prepared with facts and figures in regard to it.

Of course the first schedule to be prepared by the accountant should show the cost of the fifteen (15) percent increase requested. Actually a separate copy of the agenda should be prepared showing not only the cost of each monetary item in dollars and cents, but also expressing those dollars and cents costs in additional cents per hour wage cost. The next schedule should show the cost of each one-half percent general increase. On this schedule should be marked the top normal limit that the company would expect to go to. In addition supporting sheets should show how far above the normal figure the company would go to buy off having to settle under some of the other items on the agenda. For instance one of the subsidiary schedules might indicate that the company would go a whole extra percent to avoid having to grant anything in connection with a change in the

ANALYZING THE FINANCIAL SIDE OF THE UNION AGENDA

life insurance programme. This additional one percent might be increased to one and one-half percent if the company wishes to make no concessions under either the life insurance programme mentioned above or group hospitalization programme increases. There is an endless variety of ways that the supporting schedules can be put together in this connection and the accountant should investigate all of them.

A second major schedule to be developed by the accountant will show the cost of increases if granted in cents per hour rates rather than percentages. Unless the wage rate schedule calls for it this schedule should not be broken down into more than one-half ($\frac{1}{2}$) cent brackets. Trading in quarter cents (or less) per hour is in most companies uneconomical due to the additional overhead cost of handling and computing the fractional rates. The two major schedules, namely increases on percentage basis and increases in flat cents per hour should then be put side by side and a decision arrived at as to which one the company is going to push. The accountant can furnish a great deal of valuable information for the solution of this particular problem. Schedules showing the number of workers in wage rate bracket will point up in useable terms the number of skilled versus semi-skilled and unskilled workers. The spread in wage rates per hour between the various brackets and the effect of a flat cents per hour increase should also be scheduled and discussed with the negotiator. As a rule management has pushed the percentage raises rather than flat cents per hour. This decision is based on the assumption that the spread in wage rates between the skilled and the unskilled worker should not be changed.

Supplementary Schedules

Having completed the two major schedules the accountant must now use his imagination in determining what might be of value in connection with the general wage increase request. Very often close cooperation with the negotiator will steer the accountant along the lines of most value in the whole picture. Certainly the tabulation of historical data will be of vital importance. Post-war wage increases, etc. should be scheduled and compared with increases in the cost of living index for a like period. If it has been the practice in the past to discuss such matters at the bargaining table a tabulation of the company's net profits, increases in selling prices, etc. may all be helpful in substantiating the negotiator's case.

In recent years union strategy has been to put increasing reliance on both industry and area patterns. They naturally push whichever is the more favorable for their case in the particular circumstances. Bearing this in mind the accountant should prepare a tabulation of all current settlements in both the industry and the area. These schedules should show whether settlement was made in flat cents

COST AND MANAGEMENT

per hour or on a percentage basis. They should also indicate the cost of a like settlement to the accountant's own company. Insofar as possible the settlements should be tied into the union agenda through indicating any special circumstances which may have had a bearing in determining the amount and type of wage settlement.

Fringe Benefit Schedule

Sometimes a schedule showing the cost of the so-called "fringe benefits" is of value to the negotiator in handling the wage increase request. Other tabulations and schedules might well include local taxes paid and their increase in recent years, payroll taxes and their increase. An analysis of this or that particular cost may be of value. For instance if the cost of administrative overhead has dropped during the past year, that fact should be pointed out. Similarly if management has reinvested earnings in the business this should be brought to the attention of the union representatives. This is particularly true if the dividend rate has been cut or if it is below the industry or area pattern. A schedule showing these facts should be ready for reference by the negotiator should the necessity arise. In some circumstances a special tabulation of productivity per man hour may well be very important, this is especially true in industries having a productivity factor in their contract. The amount of overtime paid and the labour turnover are two other matters which should be investigated and scheduled.

Holidays With Pay

The second monetary item on the union agenda is a request for two more paid holidays. After determining the payroll cost of the request the accountant should tabulate the possibility of lost profits should it become necessary to shut down for these additional holidays. Just what holidays are asked for is of some concern, particularly if the business of the company happens to be of a seasonal nature. Here again practice in the industry and the area should be surveyed. Probably in this particular case the local area pattern is of as much importance as the national industry pattern. In other words, the wage earners of the L.M.N. Company would certainly like to have as many and the same holidays as their neighbors and friends.

At this juncture the accountant should, if he has not previously done so, critically survey the union agenda as a whole. He should also confer at length with the negotiator in regard to the general tenor of the requests and how they line up. One result of such a survey and conference will be the thought that requests No. 2, No. 4 and No. 5 are knit together and undoubtedly a favorable settlement of one of them would take the company off the hook for the other two. The accountant should therefore prepare a separate schedule balancing the cost of request No. 2 against the cost of request No. 4 and No. 5. This schedule will be discussed in some detail under the latter item.

ANALYZING THE FINANCIAL SIDE OF THE UNION AGENDA

Shift Differential Increase

Item No. 3 contains a request for an additional five and ten cents per hour shift differential. Pertaining only to the shift workers it will not be too costly an item to grant in part. Also if a survey of the industry or area shows the company to be under either, the demands of the union in this connection are apt to be pretty insistent; in fact these two factors, the industry and the area pattern, will pretty much determine the settlement of this item.

Vacation and Sunday Pay

Requests No. 4 and No. 5 will be taken up together as mentioned in the preceding paragraph. These requests are for an additional week's vacation for all employees having twenty-five years of continuous service, and No. 5 for double time for all work performed on Sundays.

The accountant has previously determined the cost of request No. 2 to be \$20,000. Similarly he finds the cost of an additional week's vacation to the twenty-five year employees will be \$25,000. The cost of double time for all work performed on Sundays is found to be \$238,000 provided there were full crew coverage for every Sunday during the year. There is therefore a \$218,000 spread between the cost of Item No. 2 and Item No. 5 and \$213,000 spread in cost between Item No. 4 and Item No. 5.

Despite this spread both the negotiator and the accountant arrive at the conclusion that, with one reservation, they will go for No. 5. The reservation is that for regularly scheduled seven day operations (such as watchmen, boiler house crew, etc.) no double time will be paid unless more than one-half of the labour force is working on that particular Sunday.

Their reasons for pushing for No. 5 are as follows:

- (1) The difference of \$218,000 between No. 2 and No. 5 will become \$105,000 after application of 52 percent Federal income taxes.
- (2) The practice in the area and the industry is to shut down for all paid holidays and to require that all vacations be taken.
- (3) Should business conditions warrant full operation of the plant the company would be in a position to willingly pay the \$238,000 payroll cost to procure the added production.
- (4) Should the eventuality of No. 3 above take place the company would certainly be rueing the day that it settled for two more paid holidays with consequent loss of production, or giving its most experienced and valuable help an additional week's vacation, this vacation to be taken at a time when the total resources of the company are strained to the limit to meet the volume of orders pouring in.

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To summarize then, while the accountant's figures show that double time for Sunday costs a great deal more than the other two items separately or combined the decision is to go for the double time and deny requests No. 2 and No. 4.

Additional Benefits

We have taken up in some detail the work of the accountant in connection with requests No. 1 through No. 5. The requests on the union agenda numbered 6, 7 and 8 can be dealt with as a unit as the schedules and data for one will indicate the nature of the information required for the other two. Any accountant worth his salt can really have a field day for himself tabulating and scheduling the various costs of any changes in these items. Life insurance, hospitalization insurance and pension payments lend themselves to the type of study at which the accountant is most proficient. In connection with these items some questions which the accountant should seek to answer are:

What is the cost of the various life insurance, hospitalization insurance and pension plans now in effect in the industry and the area?

What are the provisions, benefits, etc. of these plans and how do they compare with those now in force at the L.M.N. Company?

What would be the cost to L.M.N. of meeting these differences?

If not all of the changes can be afforded how much can L.M.N. afford and what can be purchased at that price?

Not too much attention has been paid to No. 9 which requests a profit-sharing plan of the company's net profits. However, the accountant should seek out all possible information and have it readily available.

Incentive

Item No. 10 requests the establishment of an incentive pay system in the finishing department. A great deal has been written pro and con in regard to incentive pay systems. However, despite all the experts tell us there are certain production processes that do not lend themselves to, or can be encompassed in, incentive pay systems.

For instance a couple of months before Christmas Johnny's mother asked him what he would like for Christmas, to which Johnny replied, "A baby brother". "Well", replied his mother, "I don't think there is time to get one before Christmas", to which after thinking the matter over a few moments Johnny replied, "Well, jeepers, Mom, couldn't you go on incentive and get it here by Christmas?"

Despite its facetiousness the story has a fundamental point which is often lost sight of in the sales patter of the efficiency experts. That point is, as has been previously mentioned, that not all production processes respond profitably to the installation of incentive pay systems.

ANALYZING THE FINANCIAL SIDE OF THE UNION AGENDA

A last general word of caution to the accountant in connection with preparing for labour negotiation would be "Be there firstest with the mostest".

FOR FURTHER READING

SIGNIFICANT ISSUES IN CURRENT COLLECTIVE BARGAINING, AMA Personnel Series No. 146.

COLLECTIVE BARGAINING AND ITS EFFECT ON OVER-ALL PLANNING, J. J. Justin, AMA Manufacturing Series No. 203.

A FAIR DAY'S WORK FOR A FAIR DAY'S PAY, AMA Personnel Series No. 162.

NOTICE OF EXAMINATION DATES

The dates for the 1957 examinations have been set as follows:

Accounting I Monday, April 29, 6 p.m. to 10 p.m.

Business Mathematics Friday, May 3, 6 p.m. to 10 p.m.

Accounting II Thursday, May 2, 6 p.m. to 10 p.m.

Industrial Legislation Tuesday, April 30, 6 p.m. to 10 p.m.

Fundamentals of

Cost Accounting Saturday, May 4, 2 p.m. to 6 p.m.

Industrial Organization

and Management Saturday, April 27, 2 p.m. to 6 p.m.

Advanced Cost Accounting

Paper I Monday, May 6, 7 p.m. to 10 p.m.

Paper II Tuesday, May 7, 7 p.m. to 10 p.m.

Preparing for Office Automation* . . .

By H. W. ROWLANDS,
J. D. Woods and Gordon Limited,
Toronto, Ontario.

In considering the installation of electronic equipment in the office a number of practical problems confront management. Who should acquire computer knowledge? Where can they get computer training and how long will it take? What can be done to facilitate an easy transition to automation and what are the first steps of installing a system? These questions are answered below.

DURING the past three or four years we have heard a great many publicity stories about "giant brains" (certainly a misnomer) and "electronic memories". Most of the stories have hinted at the "out of this world" ability of these monsters. I'm sure that a great many people have actually wondered whether there will be any white collar jobs left for humans when the electronic office really arrives. I assure you there will be. Electronic data processing machines are just new tools to let us get on with the old jobs. Certainly they are very wonderful tools, with capabilities never remotely approached by any other type of office equipment but they have a long, long way to go to match the versatility of a human clerical worker equipped with a paper and pencil.

One very important step in preparing for office automation is to properly equip yourself with a little skepticism. Don't be overwhelmed by everything you read or hear about electronic installations in other companies. Sift the stories for ideas that may be useful in solving your own data processing problems and then, if possible, see the process demonstrated on the machine itself.

You will realize at this point, that an initial programme of automation education is a most important item in preparing for office automation. Indeed that is the first advisable step for any company trying to get up to date in this field.

The day of widespread office use of electronic equipment is fast approaching. Many installations have been made in the United States and a number in Canada. The tidal wave of installations is going to be upon us within two or three years.

The idea of getting an education in office automation may have struck you as a good one but you may wonder how to get it. You may also have wondered who in your organization should start to acquire this knowledge.

Who Should Acquire Computer Knowledge?

Who should acquire the education? A top management group consisting of the General Manager, Production Manager and Comptroller would be a good representative group from most companies to acquire some knowledge of electronic equipment. This group might

* An address delivered at the meeting of the Hamilton Chapter, S.I.C.A. of Ontario, on October 18, 1956.

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be called "*Electronics Executive Committee*". Naturally these men should not be expected to acquire a detailed knowledge of electronic equipment. Their knowledge would only extend to the basic principles of operation of electronic equipment; the types of problems which can be handled; how they are handled and some general ideas of staff requirements, equipment costs, etc. This knowledge would be used to assess in general terms the possibility of utilizing this type of equipment in their own company and to determine whether a more detailed investigation appears worthwhile.

The second group requiring automation education would be those who are assigned the task of making the detailed investigation into the feasibility of using electronic equipment. The group might be called "*Electronics Working Committee*". These men should have a wide knowledge of the company's operating procedures and be capable of winning the cooperation of staff members in any and all departments. Their education must include a fairly detailed study of the principles of operation and operating characteristics of a number of different computers. This must be accompanied by at least one course in the actual programming of a machine. There is no easy definition for the qualifications these men should possess apart from their knowledge of the company's operations. They must, however, be logical thinkers.

If there is an ultimate decision to obtain a computer, the members of the Electronics Working Committee and others who are expected to help with the installation or operation of the equipment must be given detailed training in the programming and operation of the specific computer to be used.

How Long Will Training Programmes Take?

In the case of the Electronics Executive Committee at least a week to ten days' attendance at courses dealing with basic principles of electronic equipment would be required, together with a total of a week's study of selected books and articles. This should prepare them to make a general study of their own company's problems and arrive at a decision on whether a more detailed electronics feasibility study is likely to be justified.

The computer education of the Electronics Working Committee will necessarily be much more extensive and more time consuming than that for the Electronics Executive Committee members. They must become acquainted with the various types of input and output mechanisms available with different computers. They must learn something of the advantages and disadvantages of the various types of working storage and auxiliary storage. They must certainly have a reasonable knowledge of what is involved in the programming of a computer. Getting this knowledge will probably require from six weeks to two months training on a course designed to give a fairly detailed operating knowledge of at least two different computers. If

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the different members of the committee attend different courses a knowledge of the capabilities of several different computers will be obtained and may be of considerable benefit.

If a decision is eventually made to get a specific computer, a further training period of one to three months may be involved for the members of the Electronics Working Committee and any other personnel who are to be involved in the installation or operation of the computer.

How Can Computer Knowledge Be Acquired?

The first source of computer training that I would mention is the computer *manufacturers* themselves. Most of the major manufacturers of such equipment have established a variety of training courses which they conduct at different locations. In some cases they have conducted courses at the prospective users' own premises. The different courses given by any one manufacturer vary in content to suit the needs of persons whose interest may be at the Executive Committee level or the Working Committee level. In general the manufacturers' courses can be said to be second to none. However, they naturally take the opportunity to emphasize the best features of their own equipment and this may tend to bias the trainee in favour of the equipment he has seen as compared with that which he has not. Nevertheless, the manufacturers' courses are an important source of computer knowledge.

A second important source of computer knowledge is the seminars and workshops sponsored by such groups as the *American Management Association*. The *Systems and Procedures Association of America* and many others. The information gained from such training sessions will not be as detailed as that received from the manufacturers' courses. However, a great many aspects and problems of computer installations which are not covered in the manufacturers' courses, will usually be aired at such sessions.

A third source of computer education is the universities. A number of universities in the United States have conducted summer training sessions lasting from one to six weeks and these are an excellent training ground. A number of Canadian universities are conducting a series of evening courses on electronic computers. In most cases the courses are now well enough established to be very useful training. In considering university sponsored courses however, care must be taken to select a course which is not too technical or mathematical. Many university staff members in the science and mathematics fields have been called upon to give lectures on electronic computers. In most cases they are extremely well qualified to talk about computation and electronic computers. Unfortunately data processing as found in business and industry is not the same thing as mathematical or scientific computation. Therefore some of the lectures at university courses

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may be too technical or not quite suitable for the person interested in business data processing.

A fourth source of training in electronics is the seminars conducted by management consulting firms who are actively engaged in the electronic data processing field. On occasions these seminars are conducted as part of a programme sponsored by such organizations as National Office Management Association or the Systems and Procedures Association. At other times they are conducted privately for the interested members of a particular company. Utilizing the knowledge of experienced consultants can appreciably shorten the time involved in staff education on computers or in the conducting of a feasibility study.

The fifth and last source of knowledge on electronic data processing that I wish to mention is the literature on the subject. Many articles, pamphlets and books have been written on every aspect of the data processing field. Probably the best single index of the literature is the *Business Electronics Reference Guide* published by the Controllershship Foundation, Inc. of New York. This guide lists most of the American literature that may be of interest to you. The writings in the field are very extensive and it will be necessary to be quite selective if you are going to cover the material you must cover in any reasonable period.

Your Present Procedures and Office Automation

Up to now I have talked about preparing your staff for automation. It is also possible that your present procedures can be prepared for automation from the standpoint of making them more readily adaptable to electronic processing.

One of the major improvements to present routines which may be important in ensuring a ready adaptation to electronic processing is a reduction in the number of operating steps in the procedure. The principles on which electronic data processing machines work necessitate that the normal steps in the present procedures be broken down into a great many very minute steps when handled electronically. Thus it is very desirable that all unnecessary steps in present procedures be eliminated. The present clerical procedures in most companys almost certainly contain unnecessary steps, unless they have been critically reviewed within the past three or four years. As an illustration, it may interest you to know that a payroll operation which breaks down into 80 steps when handled on a bookkeeping machine may involve 800 steps when handled electronically. Of course the electronic equipment may go through all 800 steps in a second or two so that the net result is very favorable. It is obvious however, that a reduction in the number of steps involved in the old procedures may mean a more than proportionate saving in the electronic system.

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A second type of improvement in present procedures which may be of considerable importance in any proposed electronic system is the type of identification used for accounts, parts, jobs, etc. A great many companies now use some system of numbers to identify employees, customers, account classifications, parts, job orders, etc. Unfortunately even where some numerical identification is used it is likely to be rather complicated. It may be a combination numerical and alphabetic system. It may be a disjointed series of numbers. Or the series of numbers for different purposes may overlap. This problem of identifying transactions is important in using electronic equipment.

Some types of electronic data processing systems cannot handle alphabetic information at all or can only handle it by special arrangements which reduce the equipment's speed and efficiency. Naturally identification numbers which include alphabetic characters make it more difficult or even impossible to handle some work on such machines. When the use of a machine which handles both numerical and alphabetic characters with equal facility is contemplated, it may still be very desirable to develop identification numbers which do not include alphabetic characters.

A third improvement in connection with your company's procedures which may be important in considering automation is an improvement in your knowledge of how much they cost the company. It is surprising how few companies have any accurate information on costs such as salaries, floor space, machine rentals, stationery, depreciation, etc., which make up the cost of carrying out a specific process such as payroll preparation, inventory recording or job costing. Naturally the overall economy of any proposed new system is an important factor in making a decision for or against it. A complete knowledge of how much your present system is costing you is obviously essential.

Where wage or salary savings are the major gain anticipated from a computer installation, an accurate knowledge of your present clerical cost may quickly narrow the range of computers which you will want to consider. I am not necessarily suggesting that salary savings are the biggest savings you may anticipate from a computer installation. That might be quite incorrect. A great many proposed computer installations are being economically justified entirely on bases other than a salary savings.

The Planned Approach to Office Automation

In addition to the foregoing there are certain practical, active steps that must be taken in your organization to progress towards the promised land of electronics.

If we assume that the Electronics Executive Committee has been carefully chosen and duly indoctrinated into the mysteries of electronic

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data processing, their next step is to carry out what I choose to call the Electronics Preliminary Investigation. This preliminary investigation should not be a very time-consuming operation but it is very important. It will be the basis for a decision on whether a fairly large sum of money shall be spent on a more detailed feasibility study. This preliminary investigation might take approximately a week or two in a medium sized company.

The work to be done by the Electronics Executive Committee in the Preliminary Investigation would entail the following steps:

1. They must examine all the functional areas in the overall company operations to determine whether the individual functions either alone, or integrated with some related function, could be handled electronically.
2. For each functional area they must consider such factors as the volume of repetitive operations, the value of earlier or more detailed information, present equipment costs, present salary costs and the possible value of previously unavailable information.
3. Based on the present costs and the possibility of handling one or more of the possible applications on a computer, they must decide whether the possible benefits from a computer installation are sufficient to justify the establishment and training of an Electronics Working Committee to carry out a detailed feasibility study.

If we assume that the Electronics Executive Committee decides to pursue the possibility of electronic data processing the next step is the appointment of the Electronics Working Committee. The Electronics Working Committee, which would consist of two or more members, depending on the size of the computer and the extent of the applications to be considered, should report directly to the Executive Committee and should be composed of members familiar with the spheres of operation selected by the original committee as potential computer users. The members should have an intimate knowledge of the present system and procedures used in the operations to be examined. If possible the Working Committee should be headed by an experienced system and methods man.

The first duties of the Working Committee will be to familiarize themselves with the functions and operation of computers in general. This will necessitate reading and attending courses, seminars, etc., on computers as suggested earlier, and may take up to two months of the time of each member of the committee. During this educational period it will be of great benefit if the members of the Working Committee can meet regularly approximately once a week for a one-day discussion of their findings thus far.

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When the members of the Working Committee have obtained a sufficient knowledge of computers and their operation they can commence the feasibility study. In this stage they will have to examine the suggested areas of application in considerable detail to determine present practices, present costs, desired results, sources and forms of data received, volume of data processed, etc. When this work has been completed the Working Committee should be able to outline a general pattern for handling the work on a computer and to make a comparison of the present and proposed costs. This phase of the work will be quite time consuming because of the detailed nature of the procedural examinations. However, it offers the possibility of considerable savings from procedures improvement whether or not a computer is acquired. (It is interesting to note that in several actual cases procedural changes initiated during a computer feasibility study have resulted in substantial savings long before the computer was obtained).

Once the Working Committee has completed its feasibility study the results and recommendations must be made available to the Executive Committee for study. A joint session of the two committees should be arranged to discuss the proposed system, the estimated savings and other advantages or disadvantages. A decision for or against a computer can then be made on the basis of the economics involved.

If the decision is in favor of a computer there remains the important question as to which one. Although most computers have more or less the same capabilities, if speed is ignored, they nevertheless vary greatly in their efficiency and economy in specific applications. Caution must be exercised in connection with the proposals made by computer salesmen. Though they will be of considerable assistance in understanding the operation of their own computer they will naturally be biased in favor of their own equipment. The assistance of an independent consultant at this point may be well worthwhile.

Detailed Flow Charting and Programming by the Working Committee

When the decision to obtain a particular computer has been made the Working Committee must commence the most painstaking phase of the preparatory work. At this time it may be desirable to increase the number of members on the Working Committee in order that it can be split into two groups: (1) A senior group of programme planners, (2) A more junior group of Coders. These two groups will work very closely at all times but it will be from the latter group that you will develop the staff for the day to day operation of your computer once it is installed. Although I speak of splitting the Working Committee into two groups this may mean only one person in each category in a medium or small scale application.

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The first step for all members of the revised Working Committee will be to have each member trained in programming by the manufacturer of the computer which is going to be obtained. This will mean a one to three months course for each member. It is possible that all may be trained together by having the manufacturer's instructor come to the company's location.

Once the "programming" training has been obtained the work of flow charting present and proposed systems for the particular applications can commence. This flow charting will entail a very detailed examination of the present systems. It is in this phase of the work that the "thinking" which the computer is unable to do must be done by the programmers. The flow charting of a large billing, payroll or inventory application may take four to six months to complete. After this it may take another couple of months to code it (transcribe it into the code understood by the machine).

When the flow charting and coding have been completed, the completed programme must be tested at the manufacturer's test centre and revised as often as necessary until it is 100% accurate. By the time this is completed it should be approximately time for the delivery of the company's own computer. At this time the Working Committee will probably begin to disband with some of the members joining the new Computer Department. The work time of the Working Committee has been estimated to break down as follows:

- 70% on planning and flow charting
- 15% on coding (programming)
- 15% on testing, revising, etc. (debugging).

Employee Relations Programme

From the commencement of an investigation into the possibilities of a computer installation an important preparatory step will be a programme of employee education to maintain the morale of those whose work may be affected by it. It may be that the employees themselves can be encouraged to make suggestions to the Electronics Working Committee as to how the computer could be utilized. If normal staff attrition is expected to take care of anticipated staff reductions this should be made known to the employees. If the application is such that the advantage expected does not include staff reductions this also should be made known.

It is only natural that employees would be concerned about the effect of the computer on their own livelihood. It is most important that a well thought out employee relations programme be undertaken to avoid problems in this area.

Flow Charting and Programming

The work of the Electronics Working Committee in flow charting and programming the proposed electronic system is the most important,

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difficult and time consuming phase of the preparation for electronic data processing and deserves some general discussion of what it involves.

Flow Charting the Proposed Computer Programme

The detailed flow charting of the proposed electronic system can best be done after the computer has been ordered and the necessary personnel trained in the art of programming it. Planning the flow chart in its general outline and then drawing it in detail will probably take 70% of the time between the commencement of the planning and the first actual run of the application.

Before the flow charting begins it will be necessary to decide on a system of symbols to be used by all persons involved in drawing the flow charts or reading them. It will undoubtedly be necessary for persons other than the originator of a flow chart to read and work with it. Therefore, one system of symbols is imperative.

The final flow chart must be very detailed. It is not satisfactory to indicate a particular step in the process and go on to another step on the assumption that several intervening steps are so obvious that they need not be shown. The computer cannot think and therefore the simplest step in the flow chart may be of considerable difficulty when it comes time for the programmer to translate the chart into the computer's instructions. If this problem is not taken care of in the initial coding job it may cause a great deal of trouble when the programme is tested, or later on in actual use.

In the flow chart, whenever the process reaches a point where, depending upon a particular comparison, the process may follow any one of two or more paths this must be clearly indicated. This situation is commonly referred to as branching in the programming of a computer. Branching is an important, if not the most important, part of a computer programme, and is the basis for much of the computer's flexibility.

For example, in the processing of a payroll on a computer, the computer must be programmed so that persons who are earning more than \$400 per month will not have any unemployment insurance deduction and all others will. To do this it is necessary at some point in the process to have the computer compare the gross salary for each employee with a constant amount of \$400. On the basis of this comparison the computer will branch to either one of two routines.

Coding

Coding the computer programme is basically a simple operation of writing down in proper sequence the instructions which will direct the computer to go through the series of operations required to process a particular problem as outlined on the related flow chart. Although basically simple, programming requires skilled personnel due to the

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fact that particular instructions can only be given to the computer when certain sets of conditions exist. For this reason the programmer must be able to visualize at all times what the contents of the computer's memory will, or may, be after each step in the process is completed. For example, it is of no use to instruct the computer to divide a figure from a particular memory location by some other figure if there is a possibility that the first figure may be zero. This would give a meaningless answer. It is therefore necessary for the programmer to know, from a complete understanding of the preceding part of the programme all the possible combinations of items which may be in the memory and just how the computer will handle any given case.

Summary

In closing I'd like to summarize the preparation for office automation as follows:

1. Choose the right people from your staff and educate them about computers by utilizing manufacturers' training facilities, the seminars and courses conducted by consultants, universities and business associations and the plentiful literature on the subject.
2. Study your present operations, simplify them where you can and improve them with computers in mind. Also gather accurate information on the cost of carrying out the various clerical functions at the present time.
3. Ensure that your Electronics Executive Committee and Electronics Working Committee carry out a well organized preliminary investigation and feasibility study, utilizing whatever help they may need from manufacturers or consultants.
4. If you actually decide to obtain a computer, be certain that the planning, flow charting and coding are done carefully and completely.

You no doubt noticed that I said "if" you actually decide to obtain a computer. I think it would have been more correct to say "when" you decide to obtain a computer. There is no doubt in my mind that within a very few years the majority of companies of even modest size will be utilizing electronic data processing machines.

FOR FURTHER READING

- AN APPROACH TO AUTOMATION, Jrn. of Machine Accounting, L. E. Gross, Sept. 1956.
ELEMENTS OF OFFICE AUTOMATION, N.A.C.A. Bulletin, June, 1956.
HOW TO EVALUATE AUTOMATION, J. R. Bright, Harvard Business Review, July-Aug. 1955.

Manual Aspects of I.D.P* . . .

By E. F. STEVENS,
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Integrated data processing is a term much bandied about today. In the strictest sense, integrated data processing is a principle of work simplification, not necessarily associated with the popular concept of marvellous machines. In this article the author outlines some of the ways in which this principle can be put to work to eliminate unnecessary time and effort.

SOME time in 1954, emanating from discussions at an American Management Association Convention which dealt interalia with the application of modern equipment to office programming of work, some individual or group of persons in determining how best to express the basic requirements of a system which would achieve an objective with the minimum of individually divorced processes coined—quite legitimately—three words for an expression I.D.P. which has gained a great deal of popular usage for two reasons.

FIRST: The manufacturers of the processing equipment were behind the idea of I.D.P. and have in knowledgeable circles given the required gentlemanly push to the idea and the phrase.

SECOND: The phrase Integrated Data Processing rolls nicely off the tongue. The abbreviation I.D.P. is easy to remember and has the advantage of meaning nothing to the uninitiated.

Most scientific and technical advances result from the analysis of known facts and gradually planned or calculated development. As laymen in a very scientific era, we are capable of knowing our basic needs and problems and in many cases we can state our problems clearly. But when we hand them over to the scientist, the numerous and sometimes intricate steps to the solution of those problems are lost to us and from thereon we are inclined to refer back for advice to the "Specialist".

No harm in this—provided we get a balanced picture and a real solution to our problems. Provided that we know where we are going and what we really want. Provided too that we are not mesmerised into submission and expense solely by the very cute antics of clever gadgets such as flexowriters, tape machines, and punched card machines.

The Meaning of I.D.P.

Three very ordinary words in English with Latin derivation—Integrated Data Processing.

- (a) Integrated from integrare—to make whole. Verb—transitive. From the same word we get integrity—soundness—an ingredient of any good system.

* An address presented at the meeting of the Grand River Chapter, S.I.C.A. of Ontario on October 18, 1956.

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- (b) Data—from Datum—a thing known or granted.
- (c) Process—from Processus—to proceed. Verb—transitive.

Note the Transitive verbs—denoting action—movement and the inclusion of the neuter noun gives us the idea of specific things moved around to make a whole. The layman's interpretation of the term might then be "the coursing of known facts into a combined whole".

So much for our basic interpretation of the phrase.

What Is New In I.D.P.?

Other than that the three words have been associated with mechanical processes, absolutely nothing! Those of us who have any interest whatsoever in our current tasks know of the interminable struggle to devise means of accumulating information and presenting it to others in the most easily interpretable and acceptable form. This problem becomes more involved as scientific research continues to highlight the need for Company Departmental and/or Divisional co-ordination of effort.

The complex structure of many large industries involving both decentralization and centralization dependent on circumstances, the diversification of activity within corporate entities and the increasing technical specialization which research attracts to industry in general have prompted the search for quicker, more accurate means of obtaining and passing on information in order that the maximum service can be given to the public and the best use obtained of monies invested in the enterprise.

Science and technicians have worthily come up with flexowriters, common language machines, electronic computers, etc., the object of which is to reduce the manual processes of recording and utilize basic data as often or as seldom and in as varied an application as is deemed necessary to accord with the peculiarities of each enterprise in which they are installed.

Large enterprises are setting a hot and expensive pace seldom possible of attainment by the smaller competitor.

What of the Small or Intermediate Sized Enterprise?

I would hazard a guess that the economy of this country is as much affected by the activities of the multitude of small and medium sized organizations as by the fewer but individually powerful mammoth industries of national and international repute.

Can I.D.P. help these small concerns?

There can be no standard answer to this question because of the varying basic factors. For example, consider a company with a total staff of 50 which may handle a multitude of small, inexpensive products in a market where the customers number many thousands as compared with an enterprise staffed by 600 personnel manufacturing bulky

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expensive products whose principal customers are restricted to a few municipal authorities.

Before we elect for I.D.P. and associated equipment we must study the peculiarities of our enterprise, attainable economies and return on investment. If the result of our investigation rules against the acquisition of I.D.P. equipment can we do anything to ease the burden of paperwork and recording under which we continue to labour most unprofitably?

Can we for the little man gain anything from the principles established in relation to I.D.P.?

Let us see then where research and manual operations contribute to an I.D.P. system and to what extent we can integrate aspects of an operation without resorting to the use of expensive and complex machinery.

What Are the Prerequisites of I.D.P.?

I can in no way disagree with Mr. H. S. Brown who spoke on this subject at the National Conference in June 1956 when he established the first approach to I.D.P. as one of work simplification.¹ He also made a point which I would like to reiterate most emphatically. "Do not order the equipment and then figure out what to do with it but reverse the procedure by finding out what you want and then if necessary, and only if necessary, buy the essential equipment to handle the problem efficiently.

I will go further than this and affirm that before even thinking in terms of new equipment or systems the present procedure should be thoroughly overhauled and any shortcomings analyzed, reasons for inefficiencies established and you will probably find that a considerable number of the difficulties thought to be inherent in the system were caused by lack of observance of some principle or ill conceived appendices to procedures which do little more than clutter up the scene and minimize the chances of recognizing basic procedural faults.

But there is an even more important aspect of integrating data and processes. It is the need to know to what ends information is being produced at all. Too seldom we ask ourselves "Why are we doing this?" Too seldom do we challenge those deities in the executive offices concerning the need for this or that statement regularly every few days. Too seldom do our executives really study the multitude of documents received towards determining whether or not real use is made of each one or whether or not there is duplication of information being received from different and sometimes the same source. Has anyone determined for example that the real test of efficiency in an operation may be machine-hour output and not labour cost per 1,000? Has anyone determined that we really need a complete and intricate set of standard

1. This address was published in the September 1956 issue of Cost and Management.

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operating costs when in fact controls can be more effectively operated by the use of mechanical assists such as thermostats, gauges, humidifiers, etc. Has anyone had the courage to jettison previous years' statements and comparisons and work towards a planned target from month to month and into the future. There is too much reminiscing in industry these days and too little depth of vision and forward planning.

It is synonymous with the idea of any system that there must also be a positive objective. The objective can only be established by management personnel and must be sufficiently well defined to permit constructive and effective action to be taken by subordinate staff responsible for routine procedural activity. This is a basic prerequisite of I.D.P.

The management must know what it wants in the way of information and in what manner it is to be presented. From that point on, the method of obtaining and co-ordinating data in the right place and at the right time is a practical problem always possible of being solved.

Looking again at Mr. Brown's paper we find reference to the organized application of common sense to eliminate waste and here the exponents of I.D.P. breathe the same atmosphere as those of "work simplification". It is here the "layman" really recognizes the fundamental need for the integration of processing data.

Work Simplification

While this is a subject in itself we cannot disregard it in relation to I.D.P.

Let us polish up our knowledge on this subject a little with specific reference to paper work.

Where Are We Involved Here?

- (a) In the reason for the document.
- (b) In the form of the document.
- (c) In the preparation of the document.
- (d) In the distribution of the document.
- (e) In the disposal of the document.

We must sit down and analyze every aspect of each piece of paper and each written record. We must then co-ordinate our analyses having in mind elimination of work effort and/or documentation; the simplification of recording or moving—processing documents; the combining or merging of information or documents; and the routing or sequence in which information is handled.

Having done all this it would be strategically wise to adopt Alan Mogenson's attitude taking each aspect of our clarified system and asking "why". You know as well as I do the formula:

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What and Why
Where and Why
When and Why
Who and Why
How and Why

So much for work simplification.

The Relationship Between Principal Functions in Industry

Let us consider Selling

Manufacturing and
Controlling.

In time I hope the tycoons of industry will fully appreciate the need for the co-ordination and planning of Selling and Manufacturing. Without such co-ordination we will ever be improvising to cope with excesses or deficiencies in plant capacity and inventory and resultant complications in our records. This is however a wide and at the same time acute subject. Suffice it to say that except in the fields of research and "custom" made products, industry should always be in a position to sell what it manufactures and manufacture what it purports to sell.

What then do we need for recording and controlling these basic functions?

- 1st A customer's order
- 2nd A stock requisition
or
A works order
- 3rd A delivery note and/or packing slip
- 4th An invoice
- 5th A customer's cheque or cash
- 6th A receipt for payment

Now every one of these documents refers to the same one item required by the customer and yet even in these enlightened times we find in many enterprises different forms with little or no resemblance to each other to cover each of the above six or seven paper operations.

Here then is our first line of attack on basic paper work. Let us standardize the form and write common information on all forms only once. There are several ways of doing this:

1. Carbon paper and Ball point pen.
2. Spot carbon forms to eliminate some data,
e.g. price from certain copies.
3. The use of a master copy written or typed and reproduced by stencil, ditto, spirit or similar processes in whatever numbers required.
4. Multiple and continuous stationery forms.

MANUAL ASPECTS OF I.D.P.

Some companies are fortunate in their market dealings in that they have such control over their outlets that they can specify in what form original orders must be prepared, thereby standardizing all recording procedures. A typical company in this category would be a large automobile manufacturer with its own dealership organization.

Another company which I know well gets off to a good start by having all orders typed up at Branches in a standard form covering order, invoice, factory order, delivery note and necessary copies for accounting and Branch invoice purposes. A system which appeals to me a great deal is the sensematic punched card procedure which insures standardization of data on a specified form and eliminates any writing or carbon copies. The data processing of course begins at a later stage when punched cards are automatically set up from the sensematic original.

Coincidental with these thoughts do not overlook the economies to be gained by eliminating typing time and transcription errors. If the products merchandized are sufficiently few in number preprinted order and invoice forms are a great advantage. Do not overlook either the possibilities of having pricing done when an order is taken. The old story of not revealing to the plant at what prices goods are sold at is in most companies ridiculously outdated.

Consequent to the principal functions of manufacturing and selling are the maintenance of records related to material, suppliers' accounts and customers' accounts. Twenty years ago maintenance of such records was a tedious business whereby journals or day books originated a series of entries and postings to ledgers, reconciliation of periodic statements and all this gave rise to recording errors which took hours and often days to locate and correct.

You are no doubt familiar with the many systems—all variations on the same theme whereby for example, by means of a "posting-board" a journal sheet, suppliers' account record, remittance voucher and file record are prepared in one manual operation and with but little extra effort, cost and general ledger distribution of expenses analyses cards are prepared as is the cheque when payments become due. Similar one-writing processes in the form of payroll systems whereby it is possible to prepare pay check stub, payroll journal and earnings record have held the field in a wide range of organizations for some years.

The use of pegboards for assembling data and cross totalling information by the use of standard columnar strips of paper, eliminates certain rewriting operations. In the costing field one company now produces a time card, on separate hours of which, time on different jobs can be recorded. By means of spot carboning, the time and evaluated hours on each job is duplicated onto analysis slips all of which can be separated by perforations, sorted, totalled and posted

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to the appropriate jobs. The top original copy gives all the basic data for the payroll and the total of the job cost analysis must agree with total gross disbursements to employees.

You know too of the manual card clipping systems going under proprietary names such as Key-Sort, Uni-Sort, etc. Such systems are now developed to an extent whereby they fulfill many of the functions of punched card machine accounting and recording.

A fairly recent development using such manually clipped cards operates very satisfactorily in the retail furniture business. In this system for each cash stock item purchased a data card is prepared. A stub section of the card is attached to the item for sale and the data card is filed in a stock file. When the item is sold relevant information is entered on the data card which is then transferred from the stock file to the sales file. From this point on obtaining and summarizing data by pin-sorting and resorting cards in accordance with clipped edge analysis procedures is a manual and comptometer or adding machine operation.

These clipped card processes have been developed into production control and costing fields and are worth studying by anyone faced with control problems in a plant or where analytical information required and a growing business emphasize the need for more advanced systems than the original basic written records.

Semi-Mechanical Operations

It is always interesting to note how the specialty of today is the commonplace of tomorrow. Previously I indicated a relationship in the early stages of development between work simplification and I.D.P. and we have briefly mentioned punched card accounting and recording. To this I want to add a few comments on book-keeping machines and their place in the scheme of things. Originally a development of the typewriter and—adding—printing machine these ledger posting machines have by the use of carbon copies and proper alignment of printed matter been developed to accumulate mathematical data and throw out totals of columnar recordings. By such means considerable analysis of e.g. sales ledger postings can be easily effected. These machines can be obtained with devices capable of effecting multiplication of figures and printing the answer. Their use however is restricted to the number of accumulating boxes capable of being accommodated within the length of the machine platen after providing for such basic data as reference numbers, date, description of goods and type of ledger entry, etc.

In most cases analysis is performed as an extension of the basic records on the wide platen of the machine. Such machines are expensive and this must always be considered in relation to the value of the information they produce.

MANUAL ASPECTS OF I.D.P.

Punched Card Accounting

So commonplace is the installation of the familiar key, punch, sorter, tabulator, etc., that we no longer associate these machines among the more advanced equipment in business recording. The analogue and digital computers are currently stealing the thunder. Punched card machines represent the nearest approach within the last few years that has been made to I.D.P. They require however each machine operation to have close supervision and all processing steps must be originated by the manual transfer of cards and the manual settings of machine operating programmes.

In considering the use of punched card accounting we must consider the high cost of installation and the need to keep these expensive assets fully employed without bottlenecks and without producing so much information that the staff of the enterprise are incapable of understanding and/or using it to advantage.

Conclusion

Now I wonder if we have been able to get anything out of this paper? Let us review the preceding paragraphs.

First—I think we established that the term I.D.P. is a commercialism.

Second—That whether we are considering purely mechanical operations or hand operations there must be a clear objective.

Third—The objective—the report—the statement must be what management wants in the required form and obtainable where wanted.

Fourth—Only management can determine the form of information required.

Fifth—Before introducing any new procedures, mechanical or manual, an intensive analysis of the operation is essential—in fact such an investigation will pay off at any time.

Sixth—It is basic common sense to apply the principles of work simplification to every operation before determining any amendment to or alteration of a system or works procedure.

Seventh—The introduction of expensive equipment depends not on fashion or trend but on the circumstances prevailing in each enterprise considering its use.

Eighth and final—One cannot wholly eliminate the human element. Machines must be controlled and they will provide integrated data no more reliable than the basic accuracy of the information with which they are fed.

It is difficult therefore to say there are no manual functions or methods of I.D.P. Let us rather say that the integration of data processing is something that has been going on for many years. Only now are we learning how to bring mechanical aids to our service to speed up the process. By virtue of their lesser flexibility than pencil and

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paper these machines demand a standardized approach and a necessary intensive review of associated procedures which will produce evidence to justify their requisition or otherwise.

I imagine in ten years time we will be discussing perhaps the virtues and disadvantages of machines used for I.D.P. in relation to a pocket size electronic general purpose accounting and recording office installation.

FOR FURTHER READING

INTEGRATED DATA PROCESSING, H. S. Brown, Cost and Management, Sept. 1956.

INTEGRATED DATA PROCESSING — A Panel Discussion, Cost and Management, Jan. 1957.

PERSONALS

J. M. Woodley, R.I.A., has been promoted to Comptroller of McLaren Ltd., Hamilton.

Robert Després, R.I.A., has been appointed Assistant Comptroller of the Quebec Power Company. Mr. Després is Vice-Chairman of the Quebec Provincial Society and past Chairman of the Quebec Chapter.

Rosaire Gendron, R.I.A., of the Quebec Chapter, has been elected Mayor of Rivière-du-Loup.

C. A. (Bert) Spilsted, a general member of the Hamilton Chapter, has been appointed Secretary-Treasurer (Canada) of the Prestole Corporation of Canada, Oakville, Ontario. Mr. Spilsted was formerly with Dominion Fasteners Limited.

C. S. Rowe, a student member, has taken a cost accounting position with Hill, Clark, and Francis Co. of New Liskeard, Ontario. Mr. Rowe was formerly employed with the Canadian General Electric Co. Ltd., Peterborough, Ontario.

G. B. Wingham, Vice-Chairman of the Grand River Chapter, has been made Sales Manager of Canadian Office and School Furniture Limited, Preston, Ontario.

D. R. Gilmaster, C.A., formerly of the Niagara Chapter, is now associated with Johnson and Johnson, Montreal. Mr. Gilmaster was previously with Canadian Cellucotton Products Co. Ltd. in Niagara Falls.

Student Section . . .

EXAMINATIONS, 1956

FUNDAMENTALS OF COST ACCOUNTING

QUESTION I (20 marks)

A manufacturing company consists of three operating departments: Dept. A; Dept. B; Dept. C.

On January 1st, 200,000 tons of material costing \$49,000.00 were delivered to Dept. A. During the month Dept. A transferred 80,000 tons to Dept. B, and 100,000 tons to Dept. C. At the end of the month Dept. A had 16,000 tons in process, Dept. B had 20,000 tons in process and Dept. C, 10,000 tons. During the month, Dept. B had sent 60,000 tons to Finished Goods, and Dept. C had sent 90,000 tons.

Direct labour and overhead for the departments for the month were as follows:

Dept. A.	Labour:	\$4,700.00	Overhead	\$940.00
Dept. B.	Labour:	4,200.00	Overhead	700.00
Dept. C.	Labour:	4,750.00	Overhead	570.00

In all three departments the state of the closing inventories were as follows:

Materials	Completed
Direct labour	1/2 completed
Overhead	1/2 completed

REQUIRED:

- (a) A cost of production statement showing unit costs.
- (b) Departmental schedule of work in process.
- (c) Journal entries in general journal form.

SOLUTION TO QUESTION 1.

(a)

Exhibit A

A MANUFACTURING COMPANY.
PRODUCTION COST STATEMENT.

For the month ended January 31st, 1956.

Department A:

Particulars	Cost	Effective tonnages	Per ton
Raw material	\$49,000.00	196,000	\$.2500
Direct labor	4,700.00	188,000	.0250
Manufacturing expense	940.00	188,000	.0050
	<u>\$54,640.00</u>	<u>n/a</u>	<u>n/a</u>
Deduct:			
Work in process inventory, January 31st, 1956 (Schedule 1-c)	4,240.00	n/a	n/a
	<u>\$50,400.00</u>	<u>180,000</u>	<u>\$.2800</u>
Departmental production transferred as follows:			
Department B	\$22,400.00	80,000	\$.2800
Department C	28,000.00	100,000	.2800
	<u>\$50,400.00</u>	<u>180,000</u>	<u>\$.2800</u>

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Department B:

Material processed in Dept. A....	\$22,400.00	80,000	\$.2800
Direct labor	4,200.00	70,000	.0600
Manufacturing expense	700.00	70,000	.0100
	<u>\$27,300.00</u>	<u>n/a</u>	<u>n/a</u>

Deduct:

Work in process inventory, January 31st, 1956 (Schedule 1-c)	6,300.00	n/a	n/a
Finished production costs	<u>\$21,000.00</u>	<u>60,000</u>	<u>\$.3500</u>

Department C:

Material processed in Dept. A....	\$28,000.00	100,000	\$.2800
Direct labor	4,750.00	95,000	.0500
Manufacturing expense	570.00	95,000	.0060
Carried forward	<u>\$33,320.00</u>	<u>n/a</u>	<u>n/a</u>

Deduct:

Work in process inventory, January 31st, 1956 (Schedule 1-c)	3,080.00	n/a	n/a
Finished production costs	<u>\$30,240.00</u>	<u>90,000</u>	<u>\$.3360</u>

Summary:

Department A .....	.....	.....	.....
Department B	\$21,000.00	60,000	\$.3500
Department C	30,240.00	90,000	.3360

Total finished production costs.... \$51,240.00 n/a n/a

Note: The abbreviation "n/a" means "not applicable" in the determination of unit costs.

(b)

Schedule 1

A MANUFACTURING COMPANY. WORK IN PROCESS SCHEDULE. January 31st, 1956

Particulars	Department A	Department B	Department C
(a) Quantity movements: (tons):			
Inventory, Jan. 1st, 1956 .....	.....	.....	.....
Transfers from:			
Raw material stores	200,000	.....	.....
Department A .....	.....	80,000	100,000
	<u>200,000</u>	<u>80,000</u>	<u>100,000</u>
Transfers to:			
Department B	80,000	.....	.....
Department C	100,000	.....	.....
Finished goods .....	.....	60,000	90,000
	<u>180,000</u>	<u>60,000</u>	<u>90,000</u>
Inventory Jan. 31st, 1956	16,000	20,000	10,000
	<u>196,000</u>	<u>80,000</u>	<u>100,000</u>
Production loss	4,000	.....	.....
	<u>200,000</u>	<u>80,000</u>	<u>100,000</u>

STUDENT SECTION

(b) Production in terms of completed tonnages:

Material:			
Finished	180,000	60,000	90,000
Process	16,000	20,000	10,000
	<hr/>	<hr/>	<hr/>
	196,000	80,000	100,000
Direct labor			
Finished	180,000	60,000	90,000
Process	8,000	10,000	5,000
	<hr/>	<hr/>	<hr/>
	188,000	70,000	95,000
Manufacturing expense:			
Finished	180,000	60,000	90,000
Process	8,000	10,000	5,000
	<hr/>	<hr/>	<hr/>
	188,000	70,000	95,000

(c) Work in process inventories, January 31st, 1956:

Department A:

Material:

16,000 x \$0.2500 \$ 4,000.00

Direct labor:

16,000 x \$0.0250 x 0.5 200.00

Manufacturing expense:

16,000 x \$0.0050 x 0.5 40.00

Department B:

Material:

20,000 x \$0.2800 \$ 5,600.00

Direct labor:

20,000 x \$0.0600 x 0.5 600.00

Manufacturing expense:

20,000 x \$0.0100 x 0.5 100.00

Department C:

Material:

10,000 x \$0.2800 \$ 2,800.00

Direct labor:

10,000 x \$0.0500 x 0.5 250.00

Manufacturing expense:

10,000 x \$0.0060 x 0.5 30.00

Work in process inventories,
January 31st, 1956.

(Exhibit A) \$ 4,240.00 \$ 6,300.00 \$ 3,080.00

(1)

Work in process—Department A \$49,000.00

Raw material stores \$49,000.00

Raw material issued to Department A
during the month of January, 1956.

(2)

Work in process—Department A \$ 4,700.00

Work in process—Department B 4,200.00

Work in process—Department C 4,750.00

Direct labor \$13,650.00

Direct labor costs in Departments A, B
and C during month of January, 1956.

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(3)

Work in process—Department A	\$ 940.00	
Work in process—Department B	700.00	
Work in process—Department C	570.00	
Manufacturing expense		\$ 2,210.00
Allocation of manufacturing expense for the month of January, 1956, to Depart- ments A, B and C.		

(4)

Work in process—Department B	\$22,400.00	
Work in process—Department C	28,000.00	
Work in process—Department A		\$50,400.00
Process A completions and transfers— January, 1956.		

(5)

Finished Goods	\$51,240.00	
Work in process—Department B		\$21,000.00
Work in process—Department C		30,240.00
Processes B and C completions and transfers—January, 1956.		

